

AMENDMENTS TO THE CLAIMS:

1. (Currently amended) An isolated nucleic acid sequence which encodes a fusion protein and which is composed of a combination of a nucleic acid sequence encoding a fatty acid or lipid metabolism and one of the following nucleic acids:
 - a) a nucleic acid sequence of with the sequence depicted in SEQ ID NO: 1,
 - b) a nucleic acid sequence sequences which are derived from the nucleic acid sequence of depicted in SEQ ID NO: 1 as the result of the degeneracy of the genetic code, and,
 - c) a derivative derivatives of the nucleic acid sequence of shown in SEQ ID NO: 1 which encodes a polypeptide encode polypeptides comprising with the amino acid sequence sequences depicted in of SEQ ID NO: 2 and which has have at least 95% homology at the amino acid level.
2. (currently amended) The An isolated nucleic acid sequence as claimed in claim 1, wherein the a nucleic acid sequence is used as a part of the fusion protein encoding a protein is selected from the protein groups of the:
fatty acid desaturase(s).
3. (Currently amended) The An isolated nucleic acid sequence as claimed in claim1, wherein the a nucleic acid sequence is used as a part of the fusion protein encoding a protein is Δ4 desaturase.
4. (Canceled)
5. (withdrawn) An amino acid sequence encoded by a nucleic acid sequence as claimed in claim 1.
6. (Currently amended) The An isolated nucleic acid construct comprising the a nucleic acid sequence as claimed in claim 1, wherein the nucleic acid sequence is linked to one or more regulatory signals.

7. (withdrawn) The use of a nucleic acid sequence as claimed in claim 1 or of a nucleic acid construct comprising said nucleic acid sequence wherein the nucleic acid sequence is linked to one or more regulatory signals for the generation of transgenic plants.
8. (previously presented) A vector comprising the a nucleic acid sequence as claimed in claim 1 or a nucleic acid construct comprising said nucleic acid sequence wherein the nucleic acid sequence is linked to one or more regulatory signals.
9. (Currently amended) The A vector as claimed in claim 8, which is a linear or circular DNA, a phage, a virus, a transposon, a IS element, a phasmid, a phagemid, a cosmid or a plasmid.
10. (previously presented) A non-human organism in which at least one isolated nucleic acid sequence as claimed in claim 1, at least one isolated nucleic acid construct comprising said nucleic acid sequence wherein the nucleic acid sequence is linked to one or more regulatory signals or at least one vector comprising said nucleic acid sequence wherein the nucleic acid sequence is linked to one or more regulatory signals or a nucleic acid construct comprising said nucleic acid sequence wherein the nucleic acid sequence is linked to one or more regulatory signals was introduced.
11. (Currently amended) The A non-human organism as claimed in claim 10, which is a eukaryotic organism.
12. (Currently amended) The A non-human organism as claimed in claim 10, which is a plant, a eukaryotic microorganism or an animal.
13. (Currently amended) The A non-human organism as claimed in claim 10, which is a plant, a fungus or a yeast.
14. (Currently amended) The A non-human organism as claimed in claim 10, which is

Yarrowie lypolytica, Saccharomyces cereviseae, Traustochytrium, Arabidopsis thaliana, Brassica napus or Linum usitatissimum.

15. (withdrawn) A transgenic plant comprising a nucleic acid sequence as claimed in claim 1 or a nucleic acid construct comprising said nucleic acid sequence.
16. (withdrawn) A method of targeting proteins involved in lipid or fatty acid biosynthesis into liposomes or lipid bodies, which comprises combining the protein-encoding nucleic acids and one of the following sequences to give a joint protein-encoding sequence:
 - a) a nucleic acid sequence with the sequence shown in SEQ ID NO: 1,
 - b) nucleic acid sequences which are derived from the nucleic acid sequence shown in SEQ ID NO: 1 as the result of the degeneracy of the generic code,
 - c) derivatives of the nucleic acid sequence shown in SEQ ID NO: 1 which encode polypeptides with the amino acid sequences shown in SEQ ID NO: 2 and which have at least 60% homology at the amino acid level,
 - d) a nucleic acid sequence with the sequence shown in SEQ ID NO: 3 or the amino-terminal portion of the coding region of this sequence, and introducing the resulting sequence into a eukaryotic organism.
17. (withdrawn) A method of targeting proteins involved in lipid or fatty acid biosynthesis into liposomes or lipid bodies, which comprises introducing at least one nucleic acid sequence as claimed in claim 1 or at least one nucleic acid construct comprising said nucleic acid sequence wherein the nucleic acid sequence is linked to one or more regulatory signals into an oil-producing organism.
18. (withdrawn) A method of producing fatty acids or lipids, which comprises introducing at least one nucleic acid sequence as claimed in claim 1 or at least one nucleic acid construct comprising said nucleic acid sequence wherein the nucleic acid sequence is linked to one or more regulatory signals into an oil-producing organism, growing this organism and isolating the oil contained in the organism.

19. (withdrawn) A method of producing fatty acids, which comprises introducing at least one nucleic acid sequence as claimed in claim 1 or at least one nucleic acid construct comprising said nucleic acid sequence wherein the nucleic acid sequence is linked to one or more regulatory signals into an oil-producing organism, growing this organism, isolating the oil contained in the organism and liberating the fatty acids.
20. (withdrawn) A method as claimed in claim 16, wherein the organism is a plant or a eukaryotic microorganism.